

WHAT IS CLAIMED IS:

1. A device for coupling teeth comprising:
 - a tooth defining a cavity;
 - a fork like part;
 - a projecting portion having a starting area, a projection, a top, a bottom and a free end, said projecting portion decreasing in cross-sectional area from said starting area to said free end, said projecting portion being disposed at least partly within said tooth cavity, and wherein said starting area is connected to said fork-like part, said starting area and said projection comprising:
 - a parallel trapezoid in cross section, each having a long parallel side and a short parallel side, wherein said long parallel side of said starting area is disposed on said bottom of said projecting portion and said long parallel side of said projection being disposed on said top of said projecting portion.
2. The device according to claim 1, wherein the distance between said long parallel side and said short parallel side of said starting area is larger than the distance between said long parallel side and said short parallel side of said projection.
3. The device according to claim 1, wherein said top of said projecting portion defines an upper plane, and said short parallel side of said starting area extends to said upper plane.
4. The device according to claim 1, wherein said bottom of said projecting portion defines a lower plane and said long parallel side of said starting area extends to said lower plane, and said short parallel side of said projection extends to said lower plane.

5. The device according to claim 1, wherein said cross section of said projecting portion remains substantially constant between said projection and said free end.

6. The device according to claim 1, wherein said projecting portion further comprises:

an upper face connecting said short parallel side of said starting area to said long parallel side of said projection, said upper face having a convex shape.

7. The device according to claim 1, wherein said projecting portion further comprises:

a lower face connecting said long parallel side of said starting area to said short parallel side of said projection, said lower face having a substantially flat shape.

8. The device according to claim 1, wherein said projecting portion further comprises:

a plurality of lateral sides having substantially flat surfaces sloping from said starting area to said projection.

9. The device according to claim 8, wherein at least one of said lateral sides of said projecting portion comprises:

a recess for receiving a retention pin, that engages said tooth to affix said tooth in a desired position.

10. The device according to claim 9, wherein said recess extends substantially from said bottom of said projecting portion to said top of said projecting portion.

11. The device according to claim 9, wherein said recess further comprises:
a widened region at a distance from said top of said projecting portion, and
wherein said retention pin further comprises:
a locking member projecting transversely from said retention pin, said
widened region being adapted to receive said locking member of said retention pin.

12. The device according to claim 1, in which said fork-like part further
comprises:
a rear face circumscribing said projecting portion and limiting said projecting
portion from said fork-like part.

13. A system for an interlocking tooth and carrier comprising:
a tooth defining a cavity;
a fork like part;
a projecting portion having a starting area, a projection, a top, a bottom and a
free end, said projecting portion decreasing in cross-sectional area from said starting
area to said free end, said projecting portion being disposed at least partly within said
tooth cavity, and wherein said starting area is connected to said fork-like part, said
starting area and said projection comprising:
a parallel trapezoid in cross section, each having a long parallel side, wherein
said long parallel side of said starting area is disposed on said bottom of said
projecting portion and said long parallel side of the projection being disposed on said
top of said projecting portion; said cavity further comprising:

a top, a bottom, a mouth and an inner end, said cavity decreasing in cross-sectional area from said mouth to said inner end and said projecting portion being disposed at least partly

within said tooth cavity, said mouth and said inner end comprising:

a parallel trapezoid in cross section, each having a long parallel side and a short parallel side, wherein said long parallel side of said mouth is disposed on said bottom of said cavity and said long parallel side of said inner end is disposed on said top of said cavity.

14. A device for providing an interchangeable tooth on an earth moving machine comprising:

a tooth carrier adapted to be connected to said earth moving machine, comprising:

a nose region;

said interchangeable tooth configured to be removably installed upon said tooth carrier and having an interior cavity space, said cavity space configured to slidingly receive said nose region of said tooth carrier, wherein said cavity space comprises:

a longitudinal axis;

an open end;

a closed end oppositely positioned with respect to said open end generally along said longitudinal axis of said cavity space, wherein said cavity space is generally tapered from said open end through which said nose region of said tooth

carrier is insertible toward said closed end; a portion of said open end of said cavity space having a trapezoidal cross-sectional shape taken along a plane generally perpendicular to said longitudinal axis of said cavity space; and

a shorter side of two parallel sides of said trapezoidal cross-sectional shape of said portion of said open end being configured to be coincident with an upper surface of the cavity space, whereby said configuration produces a tooth-retaining wedging action of said interchangeable tooth upon said tooth carrier during operation of the earth moving machine.

15. The device according to claim 14, wherein said cavity space further comprises:

a longer side of said two parallel sides of said trapezoidal cross-sectional shape of said portion of said open end being coincident with a lower surface of the cavity space.

16. The device according to claim 14, wherein:

a portion of said closed end of said cavity space has a trapezoidal cross-sectional shape taken along a plane generally perpendicular to said longitudinal axis of said cavity space; and

a longer side of the two parallel sides of said trapezoidal cross-sectional shape of said portion of said closed end being coincident with said upper surface of said cavity space and thereby producing binding forces during use to wedge said interchangeable tooth onto said tooth carrier.

17. The device according to claim 16, wherein said cavity space further comprises:

a shorter side of the two parallel sides of said trapezoidal cross-sectional shape of said portion of said closed end of said cavity space being coincident with a lower surface of said cavity space.

18. The device according to claim 17, wherein said cavity space further comprises:

two side surfaces of said trapezoidal cross-sectional shape of said portion of said closed end being downwardly inwardly inclined.

19. The device according to claim 14, wherein said cavity space further comprises:

two side surfaces of said trapezoidal cross-sectional shape of said portion of said open end which are upwardly inwardly inclined.

20. The device according to claim 14, wherein:

a portion of said upper surface of said cavity space is inwardly concave in parallel with said longitudinal axis.

21. The device according to claim 14, wherein said tooth carrier further compromises:

an end region opposite to said nose region connected to said earth moving machine, said tooth carrier being configured at said end region to receive said interchangeable tooth thereupon, said nose region further comprising:

a junction end where said nose region is joined to a body of said tooth carrier; a distal end that is oppositely positioned with respect to said junction end generally along a longitudinal axis of said nose region, said nose region being generally tapered from said junction end toward said distal end of said nose region wherein a portion of said junction end of said nose region has a trapezoidal cross-sectional shape taken along a plane generally perpendicular to said longitudinal axis of said nose region; and

a shorter side of two parallel sides of said trapezoidal cross-sectional shape of said portion of said junction end being configured to be coincident with an upper surface of said nose region, whereby said configuration produces a tooth-retaining wedging action of said interchangeable tooth upon said tooth carrier during operation of said earth moving machine.

22. The device according to claim 21, wherein said nose region further comprises:

a longer side of the two parallel sides of said trapezoidal cross-sectional shape of said portion of said junction end being coincident with a lower surface of said nose region.

23. The device according to claim 21, wherein:

a portion of said distal end of said nose region has a trapezoidal cross-sectional shape

taken along a plane generally perpendicular to said longitudinal axis of said nose region; and

a longer side of the two parallel sides of said trapezoidal cross-sectional shape of said

portion of said distal end is coincident with said upper surface of said nose region and thereby produces binding forces during use to wedge said interchangeable tooth onto said tooth carrier.

24. The device according to claim 23, wherein said nose region further comprises: a shorter side of the two parallel sides of said trapezoidal cross-sectional shape of said portion of said distal end being coincident with a lower surface of said nose region.

25. The device according to claim 24, wherein said nose region further comprises: two side surfaces of said trapezoidal cross-sectional shape of said portion of said distal end being downwardly inwardly inclined.

26. The device according to claim 21, wherein said nose region further comprises: each of two side surfaces of said trapezoidal cross-sectional shape of said portion of said junction end being upwardly inwardly inclined.

27. The device according to claim 21, wherein said nose region further comprises: a portion of said upper surface of said nose region being outwardly convex in parallel with said longitudinal axis.

28. A device for providing an interchangeable tooth on an earth moving machine comprising:

a tooth carrier connected to said earth moving machine, comprising:

a nose region;

an end region opposite to said nose region connected to said earth moving machine wherein said tooth carrier is configured at said end region to receive said interchangeable tooth thereupon, said nose region further comprising:

a junction end joining said nose region to a body of said tooth carrier;

a distal end that is oppositely positioned with respect to said junction end generally along a longitudinal axis of said nose region, said nose region being generally tapered from said junction end toward said distal end of said nose region, wherein a portion of said junction end of said nose region has a trapezoidal cross-sectional shape taken along a plane perpendicular to said longitudinal axis of said nose region; and

a shorter side of two parallel sides of said trapezoidal cross-sectional shape of said portion of said junction end is configured to be coincident with an upper surface of said nose region, whereby said configuration produces a tooth-retaining wedging action of said interchangeable tooth upon said tooth carrier during operation of said earth moving machine.

29. The device according to claim 28, wherein:

a longer side of the two parallel sides of said trapezoidal cross-sectional shape of said portion of said junction end of said nose region is coincident with a lower surface of said nose region.

30. The device according claim 28, wherein a portion of said distal end of said nose region has a trapezoidal cross-sectional shape taken along a plane generally perpendicular to said longitudinal axis of said nose region; and

a longer side of the two parallel sides of said trapezoidal cross-sectional shape of said portion of said distal end is coincident with said upper surface of said nose region, whereby binding forces are produced during use to wedge said interchangeable tooth onto said tooth carrier.

31. The device according to claim 30, wherein:

a shorter side of the two parallel sides of said trapezoidal cross-sectional shape of said

portion of said distal end of said nose region is coincident with a lower surface of said nose region.

32. The device according to claim 31, wherein said nose region further comprises:

two side surfaces of said trapezoidal cross-sectional shape of said portion of said distal end being downwardly inwardly inclined.

33. The device according to claim 28, wherein said nose region further comprises:

two side surfaces of said trapezoidal cross-sectional shape of said portion of said junction end being upwardly inwardly inclined.

34. The device according to in claim 28, wherein said nose region further compromises:

a portion of said upper surface of said nose region being outwardly convex in parallel with said longitudinal axis.

35. The device according to claim 2, wherein said top of said projecting portion defines an upper plane and said short parallel side of said starting area extends to said upper plane.

36. The device according to claim 10, wherein said recess further comprises:
a widened region at a distance from said top of said projecting portion, said retention pin further comprising:

a locking member projecting transversely from said retention pin, wherein said widened region is adapted for receiving said locking member of said retention pin.